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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/521,879

01/21/2005

Fabrice Pardo

37392

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7590

08/21/2006

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EXAMINER

INGHAM, JOHN C

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

A

Office Action Summary	Application No. 10/521,879	Applicant(s) PARDO ET AL.	
	Examiner John C. Ingham	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/21/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The French reference (2 803 950) on the IDS filed 21 January 2005 has not been considered because the corresponding U.S. Publication number is incorrect. Therefore no English explanation of the claim 11 language is available for consideration.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the conducting strip that are adjacent to each other and connected in floating potential as recited in claim 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 3 is objected to because of the following informalities: line 3 contains the words "d'AIAs", which appears to be left over from translation. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification refers to French Application FR-A-2 803 950 for an explanation of "adjacent conducting strips with floating potential". The corresponding U.S. Publication No. (English translation) given on the IDS form mailed 21 January 2005 is not a proper Publication No. and thus no explanation of "adjacent conducting strips with floating

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potential" is made. The claim language is interpreted to mean that the strips are not connected to any voltage, but are left floating so that the device may be read.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims **1-3, 9-10, and 12-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Strittmatter (High-Frequency, Long Wavelength Resonant-Cavity-Enhanced InGaAs MSM Photodetectors).

8. Regarding claims **1-3, 9-10, and 12**, Strittmatter discloses in Fig 1 an MSM type photo-detection device (Introduction) designed to detect incident light and comprising reflecting means (DBR layer InGaAlAs:Fe/InAlAs:Fe) superposed on a first face of a support (substrate) to form a first mirror for a Fabry-pérot type resonant cavity (Introduction), a layer of material that does not absorb said light (InAlAs), an active layer (absorbing layer) made of a semiconducting material (InGaAs:Fe) absorbing incident light and a network of polarization electrodes (interdigitated Pt/Au electrodes) collecting the detected signal, the electrodes network being arranged on the active layer, the electrodes network being composed of parallel conducting stripes at a uniform spacing (1.0µm) at a period less than the wavelength of incident light (1.31µm), the electrodes network forming a second mirror for the resonant cavity (Introduction), the optical

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characteristics of this second mirror being determined by the geometric dimensions of said conducting strips, the distance separating the first mirror from the second mirror being determined to obtain a Fabry-perot type resonance (phase-matching, pg 146) for incident light between these two mirrors.

9. Regarding claims **13 and 14**, Strittmatter discloses in Fig 1 the photo-detection device according to claim 1 wherein a passive layer of silicon nitride is deposited on the electrode network.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims **4-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Strittmatter and Brown (US 5,663,639). Strittmatter discloses the photo-detection device

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according to claim 1, but fails to specify wherein the reflecting means forming a first mirror are composed of a silver, gold, or aluminum layer, or a multilayer dielectric.

Instead Strittmatter discloses a Bragg mirror (DBR) of AlAs and AlGaAs.

Brown teaches in Fig 4 that a metallization layer (17) of gold may be used as a bottom reflecting layer in order to improve reflect photons and serve as a heat sink (col 7 ln 30-37). Brown also teaches in Fig 5 that instead of the metallic layer, a multilayer dielectric mirror (202) of AlAs and AlGaAs may be used, also to reflect photons and improve the conversion efficiency (col 7 ln 49-53). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Brown on the device of Strittmatter in order to improve the conversion efficiency of the photo-detection device.

13. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strittmatter and Henning (US 6,528,827). Strittmatter discloses the photo-detection device of claim 1, but fails to specify wherein the layer of material that does not absorb light is made of $\text{Al}_x\text{Ga}_{1-x}\text{As}$, wherein x is of the order of 0.35, and the active layer is made of GaAs.

Henning teaches in Fig 6 that GaAs is typically used for active layers (104) to absorb light (col 4 ln 33), and layers of AlGaAs (106) with aluminum concentrations around 0.3 (col ln 4 ln 32) are used as transparent wide band-gap layers (col 2 ln 20-24) and buffers between high concentration layers and absorption layers (col 4 ln 33). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Henning on the device of Strittmatter, providing a conventional

GaAs absorbing (active) layer and a transparent wide band-gap layer of AlGaAs, functioning as a buffer between the DBR and absorbing layer while at the same time remaining transparent to light.

14. Claim **11** is rejected under 35 U.S.C. 102(b) as anticipated by Strittmatter or, in the alternative, under 35 U.S.C. 103(a) as obvious over Strittmatter and applicant's admitted prior art FR-A-2 803 950. As best understood, Strittmatter discloses in Fig 1 the device of claim 1, wherein the electrodes network is composed of conducting strips (interdigitated electrodes) that are adjacent to each other and connected to potential voltages, which may be floating. In the alternative, if Strittmatter does not disclose the electrode network as claimed, the applicant's admitted prior art teaches the alternative configuration as recited in the specification on page 10.

15. Claim **15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Strittmatter and Itatani (US 5,945,720). Strittmatter discloses the device of claim 1, but does not specify wherein a second face of the support has an electrode to apply an electrical field to the device the change the resonant wavelength of the resonant cavity by the opto-electric effect.

Itatani discloses in Fig 7 wherein the support of the Fabry-Perot resonator structure has an additional control electrode (12) that allows the optical properties (absorption coefficient, refractive index) to be varied (col 10 ln 32-40). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Itatani on the device of Strittmatter in order to allow control of optical

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properties. Placement of the extra electrode on the top or bottom face of the support substrate would be an obvious design choice.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Ingham whose telephone number is (571) 272-8793. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

John C Ingham
Examiner
Art Unit 2814

jci



HOAI PHAM
PRIMARY EXAMINER